

CLAIMS

1. A drop tube type particulate crystalline body producing device for creating a substantially spherical crystalline body by solidifying a particulate melt of an inorganic material while allowing it to free-fall inside a drop tube, wherein:

gas flow formation means for forming inside said drop tube a flow of cooling inert gas going from top to bottom is provided; and

said drop tube has a cooling tube, the cross sectional area of which becomes smaller toward the bottom such that the cooling gas flow speed becomes substantially equal to the free fall speed of said particulate melt, and a solidification tube which is connected to the lower end of the cooling tube and has a cross sectional area enlarged discontinuously from the lower end of the cooling tube.

2. The drop tube type particulate crystalline body producing device according to claim 1, wherein said gas flow formation means is provided with an external path connected in parallel to the drop tube, and a gas circulating fan.

3. The drop tube type particulate crystalline body producing device according to claim 2, wherein an annular gas introducing portion connected to said external path is provided at the upper end portion of said drop tube.

4. The drop tube type particulate crystalline body producing device according to claim 1, wherein a speed reducing mechanism for rapidly reducing the cooling gas flow speed is provided inside said solidification tube.

5. The drop tube type particulate crystalline body producing device according to claim 4, wherein said speed reducing mechanism has a partially spherical speed reducing member which includes a facing portion orthogonally facing the

gas flow of the cooling gas inside the cooling tube.

6. The drop type particulate crystalline body producing device according to claim 1, wherein said particulate melt goes into a supercooled state during its fall inside the cooling tube and is solidified rapidly by the impact when the [fall] speed is rapidly reduced inside the solidification tube.

7. The drop tube type particulate crystalline body producing device according to claim 2, wherein said gas flow formation means is provided with a cooling device for cooling the cooling gas.

8. The drop tube type particulate crystalline body producing device according to claim 1, wherein said inorganic material is a semiconductor.

9. The drop tube type particulate crystalline body producing device according to claim 8, wherein said semiconductor is silicon.

10. The drop tube type particulate crystalline body producing device according to claim 1, wherein said cooling gas is helium gas or argon gas.

11. The drop tube type particulate crystalline body producing device according to claim 1, wherein said gas flow formation means has pressure-temperature adjusting means for adjusting the gas pressure and temperature of the cooling gas inside said drop tube.

12. The drop tube type particulate crystalline body producing device according to claim 1, comprising a melt formation device for creating a particulate melt and dropping same into the drop tube, the melt formation device being connected to the upper end of the drop tube.